

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in or relating to Circulator Units for Central Heating Systems

I, FRANÇOIS JARSAILLON, a French citizen, of 50, Rue Juliette Récamier, Lyons, France, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to circulator units for central heating systems and especially to central heating systems having hot-water pipes. It has for its chief object to provide an improved unit which will greatly accelerate water circulation so that more efficient use can be made of the heat produced by a boiler, with a consequent reduction in operating costs.

A further object of the invention is to provide a circulator unit which will work without any lubrication without appreciable wear and which is smooth and noiseless.

The circulator unit according to the invention comprises a rotary pump driven by an electric motor in which an impeller is coupled directly with the rotor of the electric motor and a proportion of the liquid circulated through the pump is directed via radial openings in a chamber between said motor and said pump and through which the rotor shaft extends into a liquid-tight jacket enclosing the rotor and thereafter flows between the rotor shaft and the bearings in which the rotor shaft is mounted for the purpose of ensuring lubrication of the latter.

The accompanying drawing shows by way of example a constructional embodiment of the invention. In the drawings:—

Figure 1 is a sectional view of a circulator unit according to the invention;

Figure 2 is an enlarged sectional view of a detail of a device for controlling the direction of rotation of the impeller of

such a unit, and

Figure 3 is a side view of Figure 2.

The circulator unit being directly coupled with the motor, having no stuffing-box, and being constantly lubricated by a water-film, works without any appreciable wear and without any noise. In case of stoppage of the motor, the pump offers only insignificant resistance to the passage of the water, in spite of its excellent operating efficiency during normal working.

The circulator unit shown in Figure 1 comprises a pump 1, connected by means of a flange 2 to an electric motor, which comprises a stator 3 and a rotor 4 which are separated from each other by a jacket 5 made of metal or plastic material.

A shaft 6, provided with a longitudinal passage 7 and centered with some clearance between the bearings 8 and 9 of the flange 2 and the chamber 10, couples the rotor 4 with the paddle wheel or impeller 11 of the pump 1.

Between the flange 2 and the rotor 4 is a stop 12, one part of which consists of mobile jaws made of special bronze and another part of which is made of stainless metal and shaped to fit the rotor.

The chamber 10 is formed with holes 13 which allow the passage of a part of the water displaced by the pump 1, through the ducts 14 of the flange 2, and through the bearings 8 and 9. The passage 7 in the shaft 6 assures the reflux of the water traversing the bearing 8, which is then reconducted through the openings 15 into the pump.

The bearings 8 and 9, as well as the stop 12, are thus permanently lubricated by a liquid-film derived from the heating water, brought hereafter by centrifugal action towards the impeller 11.

This arrangement is remarkably reliable in service, due to the permanent

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presence of a water-film between the mobile and immobile parts which prevents any friction of metal on metal, thus rendering wear negligible.

- 5 The jacket 5, situated between the stator 3 and the rotor 4, guarantees the tightness of the apparatus and obviates the drawbacks associated with the usual stuffing-boxes, which considerably impair the power developed by the motor.

- 10 The pump is adapted so as not to offer any significant resistance to the passage of the heating water in case the motor should stop. Its working output is, notwithstanding, very high.

- 15 Instead of their usual construction, the stator 3 and the rotor 4 may consist of an agglomeration of iron-powder and appropriate plastic material. The rotor 20 4 may be of vacuum-die-casted aluminium or copper.

The plug connection being placed at the end of the motor in 28, greatly facilitates mounting and connection.

- 25 Since there is very little friction between the rotating parts and the bearings, the operation of the apparatus is absolutely noiseless.

- 30 The power consumption of the circulator unit which increases considerably the circulation of the heating water, is extremely low and is very soon recovered by the resultant economic use of the caloric output of the boiler.

- 35 The circulator unit may be employed for liquids of any kind.

- Owing to the noiseless working of the apparatus it is difficult to control its working condition otherwise than by 40 direct contact with its shaft. For this purpose the circulator unit is provided with means whereby rotation of the shaft may be initiated.

- 45 At the end of the case 1 of the circulator unit and in the axis of its shaft is a tapped projection 16, adapted to receive a guide comprising a threaded head 17 and a flange 18, integral with a threaded casing 19 which is covered by 50 a screw cap 20, tightened by means of a gasket 21. The bore of the guide is occupied by the rod 22 of a screwdriver 23 which is pressed back against the head 17 and out of reach of the slot 27 at the 55 end of the shaft of the impeller, by means of a spring 24 which rests against the bolt 25 and is fixed at 26.

- 60 In order to use the controller, the cap 20 is unscrewed and the screwdriver 23 is pushed into the slot 27, where it controls the operation of the accelerator. In case of necessity the shaft of the pump

may be loosened by means of a wrench acting upon the bolt 25. The direction of rotation is indicated by that of the 65 screwdriver 23.

The position of the rod 22 of the screwdriver 23 makes the bolt 25 easily accessible even in the vicinity of a wall or a partition. When the cap 20 is being un- 70 screwed only a few drops of the liquid escape; emptying of the apparatus is, therefore, unnecessary.

It is to be understood that the circulator unit as described may be modified 75 in its constructional details in any appropriate manner within the scope of the invention claimed.

What I claim is:—

1. A circulator unit for central heating 80 systems comprising a rotary pump driven by an electric motor, and in which an impeller is coupled directly with the rotor of the electric motor and a proportion of the liquid circulated through the 85 pump is directed via radial openings in a chamber between said motor and said pump and through which the rotor shaft extends, into a liquid-tight jacket enclosing the rotor and thereafter flows 90 between the rotor shaft and the bearings in which the rotor shaft is mounted for the purpose of ensuring lubrication of the latter.

2. A circulator unit in accordance with 95 Claim 1 wherein the rotor shaft extends through a chamber having inlet holes and outlet ducts through which liquid passes into said jacket.

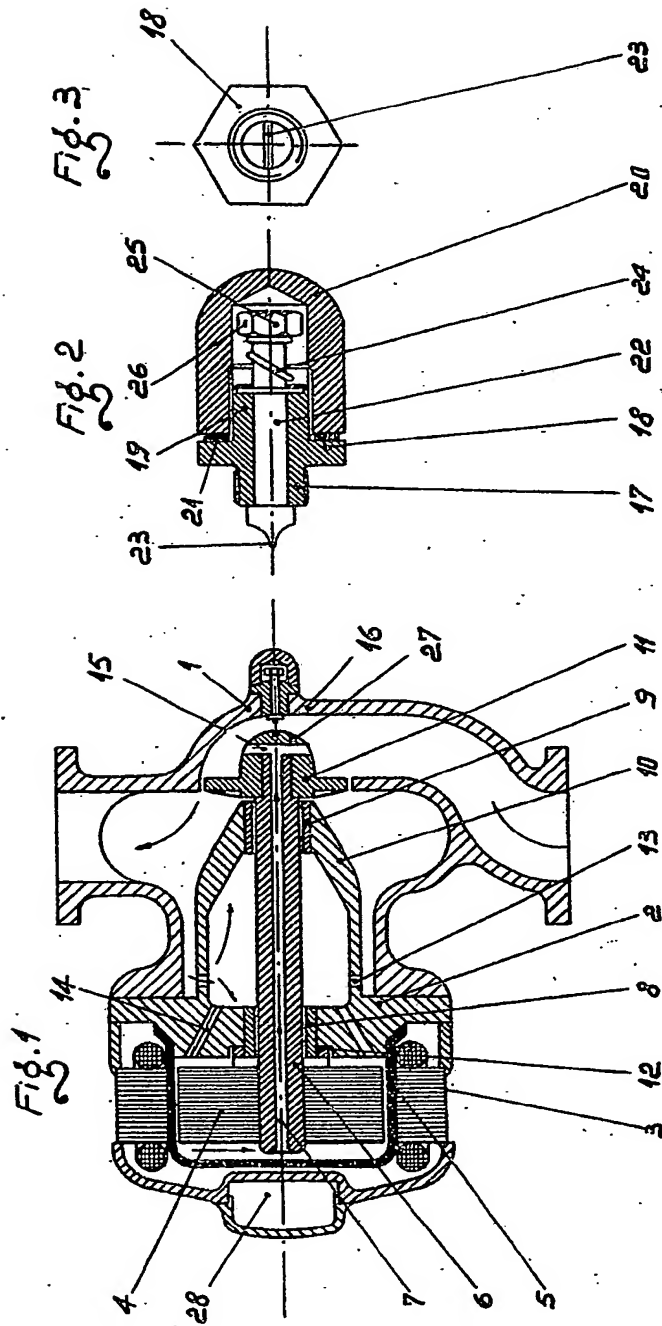
3. A circulator unit in accordance with 100 Claims 1 or 2 wherein the rotor shaft is hollow so as to enable liquid to return therethrough to the impeller.

4. A circulator unit in accordance with 105 any of Claims 1 to 3 including means in the pump casing and movable inwardly thereof for initiating rotation of the impeller.

5. A circulator unit in accordance with 110 any of Claims 1 to 4 wherein the rotor is formed of an agglomeration of iron powder and plastic material in place of conventional stampings.

6. A circulator unit for central heating systems constructed and arranged 115 substantially as described with reference to the accompanying drawings.

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